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A MONTHLY REPORT BY ESTHER DYSON

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A HITCHHIKER'S GUIDE TO THE FORUM

Each year we publish a special issue of *Release 1.0* to serve as a guide to the Forum, outlining the major topics to be addressed and profiling the speakers and companies involved (in **boldface**). We hope you will find this useful reading on your way to Tucson, or informative even if you were not able to attend. We can't tell you what will happen, only what will be discussed; we're trying to tell you how to pick companies to see, not to describe them completely. And we're trying to raise issues, not resolve them.

Preparing this documentation is like doing the documentation for any product or service: If you do it first, it should help you to create a better product. Likewise, reading this documentation is like reading the documentation for any product: If you read it first, you should be able to get more out of the Forum. We hope you find them both informative and amusing!

We have divided the Forum into three days, but they overlap. On Monday, we explore the electronic frontier as a whole. On Tuesday, we look at the impact of modularity, or object orientation, on both business and technology. And on Wednesday, we look at pen computing and groupware -- the way the new technologies will touch users in the future.

We have a smaller selection of company presentations this year than last, in order to make the presentations more relevant to the conference as a whole and also to garner larger audiences for each. Part of the purpose of a conference is to gather people for a shared experience -- not just to talk to each other, but to compare views about the same things. While we're not hoping for consensus, we are hoping for group discussion.

This year we expect Notes to play a larger part in that discussion. For starters, we'll have more client machines available, so that people can make comments and statements, ask questions, arrange meetings, rebut arguments and generally communicate. A speech is one person talking to many; audience discussion is several-to-many; sitting at a Notes terminal is one-to-many and also many-to-one. Each user gets the chance to write his piece without interruption, and to read everyone else's. But we hope Notes will also encourage people to use the added benefit of offline conferencing and follow up in person on comments they find intriguing or provoking.

THANKS TO BILL GROSS
FOR KNOWLEDGE ADVENTURE!

<u>INSIDE</u>	
HITCHHIKER'S FORUM GUIDE	1
<i>Forum documentation.</i>	
THE ELECTRONIC FRONTIER	2
<i>Public issues.</i>	
<i>Content issues.</i>	
OBJECTS	7
<i>Business reflects technology.</i>	
<i>Technology reflects objects.</i>	
PEDNESDAY	10
<i>Is the pen the point?</i>	
<i>Shared ideas on groupware.</i>	
COMPANY PRESENTATIONS	13
<i>Who and what.</i>	
SPEAKERS & COMPANIES	23
<i>How to find them.</i>	

MONDAY: THE ELECTRONIC FRONTIER

The electronic frontier is our industry's new business environment. We are creating it, and we will operate within it. When we as an industry started, we were a fringe group -- hot stocks, exotic technology, weird science. But now we're so big that we matter. Like it or not, other people take this industry seriously, obliging us to take ourselves seriously too. Adulthood gives you freedom -- and also responsibility.

In that sense, Mitch Kapor is one of this industry's leading grown-ups. Rather than relive his exciting childhood with another start-up, he has taken on a bigger challenge by founding the Electronic Frontier Foundation. Right now the frontier is still the last bastion of freedom, but with so many settlers, it needs a set of policies to govern its growth. The electronic frontier exists not just in Silicon Valley, but everywhere that telephone lines, cable tv, wireless phones, satellites and other media reach. The idea isn't (at least in our minds) that it should be centrally controlled or even financed, but that there should be clear policies by which local control operates and local nodes can interoperate.

This issue will be available on the Notes server and in demos from AMIX and Delta Logic, along with selected back issues. You can get more information from them than from this paper version.

"In order to have local control," says Kapor, "we have to do something now. There are lots of forces already in motion; we have to wake up to them." Overcoming his natural aversion to large institutional concentrations of power, he has been spending a lot of time in Washington recently, reverse-engineering the public-policy process with intellectual curiosity and a certain interest in the outcome.

Setting policies for the Frontier

Kapor will deliver a "scouting report" from the frontier and from Washington, outlining the need for a widespread, user-to-user communication platform -- both communication standards and a public network accessible to everyone. (At a Tuesday special session just before cocktails, he will go into more details on the EFF itself. As a member of EFF's board of directors, we are sponsoring this event.) A model familiar to us all is the Apple II and the PC, which together created a vigorous, flourishing personal computer industry. The difference is the need for public funding to create a similar widely available platform for personal communication and wide-area networking -- the platform that will support much of the technology to be covered in the three days of the Forum.

Encouraging such developments is the basic task of the Electronic Frontier Foundation. We're personally uncomfortable with the notion of government funding for anything; however, since the government does have an industrial policy, it might as well favor the electronic frontier rather than the industrial backwaters it currently succors.

What does the industry need to do? (Aside from joining the EFF, of course.) It has to pay attention to debates among the RBOCs and cable tv interests and

newspapers, funding decisions in Congress, and other seemingly far-off events. An industry that grew up on self-reliance is now about to come under the sway of external forces. We can't control them but we can influence them. We are no longer in the truck-building business, so to speak, but in the transportation business; government decisions about highways, airport funding and freight prices affect us. We are part of the country we live in.

Like the physical frontier of the last century, the electronic frontier right now is a wild, confusing place -- not because the people in it are bad, but because there are no clear laws, no visible boundaries, no clear routes of travel. Everything from the rules of ownership of intellectual property to the obligations of public utilities and the definitions of new kinds of services have not yet been determined. Like other early settlers, we have to get together and define the government and laws we want. Otherwise some other government will do it for us.

In addition to funding, it's important to have standards for the loose collection of linked networks that comprises the global network, underlying a diversity of services. Just as personal computer standards fostered a variety of applications, so will network standards foster interconnection and network applications: e-mail and information access and shop-by-mail, wide-area applications built with XcelleNet, support groups run on CompuServe, on-line newspapers and other services from The Washington Post and America Online, vendor-sponsored information access from Prodigy Services, information markets such as American Information Exchange, telecommuting, political action (for and against whatever you're for). Configuration services such as that potentially run by Trilogy Development, travel agencies, and others will all operate over the network, allowing customers direct contact with vendors or efficient third-party packaging of services.

Setting policies for the Frontier

Allan Weis of Advanced Network & Services will also discuss the Internet in particular. (Read and listen carefully; it's confusing!) The Internet grew out of ARPANET, a Defense Department-funded research project started in the Sixties. Ostensibly limited to educational and research uses and provided "free," the Internet now supports about 4 million users. Most of those don't connect to the Internet directly, but get to it through regional networks or commercial carriers such as MCI. One of the major segments of the Internet in the US is the National Science Foundation backbone service, which connects the research and education sites sponsored by the agency. The current NSFNET backbone service is managed by ANS as part of ANS' network. ANS is a not-for-profit company formed by IBM and MCI with donations of about \$5 million each plus equipment, and by Merit, a consortium of Michigan universities. ANS also sells its network attachments to commercial customers -- thus opening up the Internet to commercial traffic amidst some controversy. The Commercial Internet Exchange, a group of Internet-connected independent services, is also bringing in commercial customers. This competition is a little awkward, given that ANS has both for-profit and not-for-profit arms, while CIX members are basically commercial. In order to make things punctiliously correct, NSF has announced plans to solicit bids on a new contract for network services when the current contract with ANS expires next fall.

Clearly, keeping the commercial and noncommercial parts of the Internet separate is a messy proposition. Indeed, we think it would make more sense to make the whole venture for-profit, and simply to subsidize the Internet by subsidizing its users. That of course would mean that only the favored people at a university, instead of random students, would have access to the Internet once it was explicitly charged for. How to resolve this? One way, in the long run, is to make it so cheap to everyone (through widespread installation and usage) that this is no longer an issue.

The Internet is going commercial: more and more non-research, non-education types are joining in. But what is commercial: Two researchers arguing about a project that may one day become a product? An MIT research assistant discussing a job with a Sun Microsystems team leader? Two commercial product developers discussing the finer points of e-mail? Or two salesmen discussing the finer points of e-mail pricing? What about Juan and Alice, both students, trading sweet nothings? Or a Soviet scientist-entrepreneur seeking conference invitations in the West?

These new media and infrastructures raise perplexing questions. Is the electronic infrastructure the equivalent of the highway system, something that should be built by the government for the good of the country? Or are there ways for the government to *fund* it while allowing private enterprise to build it? Or is that taxing the many for the good of the networked few?

What's the role of the RBOCs, the government, private enterprise? How can we get people to use it -- assuming that we should? What does it mean to this industry -- as medium, customer base, competition? Who's responsible for the content? What happens to the press? What about privacy and data ownership?

(Note that the global net still doesn't usually reach to where most people are much of the time: walking or riding around, sitting in meetings, in other people's offices. That's a topic for Pednesday.)

Whither the establishment?

In this world of filtered, mediated communications, what's the role of press and government? If everyone can communicate with everyone, what's left for the press and the government to do in an increasingly flat world? Two things happen. People form their own communities, and the press and the government (the good ones, anyway) try to set a broader agenda, drawing people's attention beyond their own interests and self-interest.

Communities are natural. The idea of the global village was misguided; people can't operate on such a large scale. Instead, they form new villages, unconstrained by space, but clustered on some common interest (or self-interest): user groups, health issues, professional societies, etc. People have a persistent tendency to form tribes -- which can be either healthy or self-destructive. People with common interests can get human satisfaction from sharing them and can work together effectively; on the other hand, they can also shut out the outside world and disregard the claims of outside society (a tendency that manifests itself in warfare, protectionism and other geopolitical misbehavior).

Online services will cater to this tendency by allowing users to form tightly linked communities and markets. Aside from the "small-i internet," which is a self-organizing, fluid community without a clear commercial structure yet, and e-mail services such as MCI, the current leaders are CompuServe, Prodigy and America Online (as opposed to information services which deliver information but not access to other people). Each has a different business model. With about 1.4 million individual users (750,000 households), Prodigy's business model is akin to an interactive version of cable tv, delivering targeted information to targeted consumers with some interactivity and transaction capabilities added. CompuServe and America Online are targeted more at people who use their computers to manipulate information as well as receive it.

While Prodigy does pay some outside services, CompuServe and America Online have more of a cottage-industry approach -- with America Online addressing people at home while CompuServe addresses them at work (although that distinction is fuzzy). Also, CompuServe encourages a sort of information market, where private entrepreneurs (or software vendors wanting to offer online support) can apply to run forums. CompuServe actually pays them a percentage of the traffic they generate -- usually around 5 to 10 percent. Altogether, CompuServe has 225 hardware and software support forums and 120 non-computer forums. CompuServe Information Services revenues in 1991 were about \$100 million, from 925,000 users.

Prodigy's vp and general counsel George Perry has borne the brunt of controversy recently: Is Prodigy an editorial product subject to control by the publisher, or is it a common carrier that should allow anything to be transmitted and in turn be absolved of any liability? (Note that only governments and monopolies can censor; in a competitive market, when publishers refuse to publish something, the source can find other outlets.) Perry argues that Prodigy and similar services are both -- but should two such distinct entities be mingled?

Content on the network

Aside from the political issues, how will the global network change how we receive information and live our lives?

Michael Dell will talk not about the stunning success of Dell Computer, its high-quality, low-price machines and why you should buy one, but rather about how the company uses e-mail and groupware internally. For instance, when we recently bought a laptop from Dell, word filtered back to Michael. (We didn't get a discount, but at least our purchase was appreciated in high places!) This raises interesting questions: How much garbage does Michael get in his daily load of e-mail? Is e-mail simply a new avenue for tomorrow's corporate climbers? Will we all be drowned in a sea of horizontal, non-hierarchical communication?

Indeed, Dell will address these questions and talk about how the company uses database, e-mail and Notes to manage the company more tightly, and even to communicate with many customers. (Nor is Dell alone: Richard Schwartz at Borland, for example, keeps in touch with Scotts Valley mostly by MCI mail -- as do many Borland employees throughout the US.) June Rokoff, senior vp for Lotus's consulting and information services, will discuss how customers are using Notes and what they're still asking for. (Lotus uses Notes internally to make sure customer requests filter back to development.)

While technologists are excited about multimedia, text filtering and other developments, who's going to create the content? While most of the traditional press is afraid of high-tech, and the American Newspaper Publishers Association is waging war against cable tv companies and RBOCs, the traditional press actually has a real edge in these new markets if it could only get over its fears. After all, technology could leverage the scarce resource they control -- informed reporters and editors capable of sound judgment.

Yes, technology will raise the relative power of free-lancers to find both short-term employers and readers -- bypassing the formal media entirely. But the press does have brand-name power -- increasingly important in a world of cacophonous, overwhelming information (see Release 1.0, 6-91). Just as newly free people in the East are bewildered at the proliferation of new media and don't know what to believe, so will we too (from a broader base) find the array of information sources difficult to sort out. The press, if it does its job well, will be able to leverage its credibility. Its role is not just to create (or find out information), but to assess it and digest it for the ultimate readers. Who gave it that right? No one, which is why we don't believe in a government-controlled press. But a variety of media companies have earned leading positions by providing credible information over the years (or titillating entertainment, in other cases).

The Washington Post Company is an excellent case in point. The company is already the owner of Legi-Slate, an online database of current legislative proceedings. Ralph Terkowitz, vp information technology, is looking for software that could make Legi-Slate more useful and more broadly available. Currently the service has its own unique interface; to use it, you have to work with Legi-Slate's proprietary indexing scheme and query syntax. Something like the Wide-Area Information Server standard (see Release 1.0, 4-91) could help solve the problem if it were widely enough implemented. Terkowitz is also working on providing the content and format for a CD-ROM project that would use some of the superfluous information that currently stuffs the archives, floors and disk drives of the Post's key properties, the Washington Post newspaper itself and Newsweek magazine. In the course of reporting stories, its journalists routinely gather far more information, photographs and other material than they can or want to use in existing formats. One result is Newsweek Focus, in which Newsweek offers its readers additional editorial content in their specific field of interest (you pay extra for extra pages). The Post is now looking at higher-tech ways of offering "tell-me-more" service -- for example, on CD-ROM. While extra material can't just be put wholesale onto a CD-ROM, some of it could, with a little amount of editing, provide useful background for the daily news.

Thomas Malone of MIT's Center for Coordination Science will address the electronic frontier from a more macroeconomic perspective. As communications among firms improve, there's no longer as great a need for large firms (see Release 1.0, 6-91, 9-91, 11-91). Outsourcing is one sign of this; so, perhaps, are some of the alliances and decentralizations that will be discussed on Tuesday. Communications makes firms more flexible; customers needn't be tied to a single supplier; employees can more easily find work. As technology makes it easier for separate modules to fit together on one level, the communications infrastructure makes it easier to find and assemble those modules on another. Theoretically this will lead to a more efficient world, but what about those old virtues of loyalty, team spirit and personal leadership?

TUESDAY: OBJECTS IN BUSINESS AND TECHNOLOGY

Object orientation allows us to use 1s and 0s to model reality, making software easier to use and modify. Overall, it allows us to build software out of fungible components, instead of creating software monoliths that are difficult to change. David Liddle, now at IBM but speaking as an old industry hand, has devoted the last few years to fostering the development of supporting architectures and component libraries. (Other examples include HyperDesk and Serius, both to be shown in company presentations.)

Liddle will discuss the business implications of such fundamental changes in architecture: Hardware, system software and applications used to be three separate, nicely defined layers. Now, many functions that were once applications are now being generalized and are being offered as part of an operating environment, such as Transarc's Encina and Tivoli's WizDOM. But that operating environment isn't an operating system; it's really a fluid layer of interchangeable modules that sit on top of a small operating system kernel. Thus we now have four layers -- or actually, a collection of objects sitting on top of or around the operating system, which is itself really just a thin layer around the hardware.

This modularity is changing business dynamics for suppliers of these components. Application vendors are getting involved in setting standards for some of these modules, most recently mail. Lotus, Novell, Borland, IBM and Apple now all support the Vendor-Independent Messaging interface spec -- a development spurred by Lotus's Open Mail Interface. This API will run on a variety of platforms, as opposed to Microsoft's Mail API, which is specific to Windows (for now). In the long run, operating system vendors will lose some of their power -- but not so much to individual application vendors as to users. It will be harder for any single vendor to gain (or retain) a stranglehold over the industry. Object-orientation allows customers to acquire mostly coherent, cohesive systems from a fragmented supplier community.

But that doesn't mean that everything is in place already. First, we'll need system integrators, using technology like that shown by **Trilogy Development** to assemble systems. Some will be mere distribution channels; others will build and customize systems out of components. One big issue is how those components will be charged for, especially as they get reused, incorporated into other components and otherwise lose their identity on their way into users' systems. Some big vendors such as DEC are looking at getting into the information utility business, where they will build systems themselves and charge users for transactions. How will they compensate the originators of the components they use? What distribution channels and payment mechanisms will we use? What does this mean for the definition and protection of intellectual property?

Meanwhile, what about all these alliances and downsizings? IBM is devolving into a larger number of smaller units, some of them operating quite autonomously. One thing we hope to hear from **Jim Cannavino** is exactly how autonomous he feels, and how he now operates under the IBM corporate umbrella. Simultaneously, what does he owe to IBM's many partners? Can an alliance work without direct financial links to focus a company's efforts? Conversely, how many alliances can you have at the same time? How can a small company such as NeXT or GO have a serious impact on a company like IBM in the first place? What management objectives you are measured by?

Microsoft is taking a different approach: It needs few alliances because of its marketplace power. Third parties support its products without direct encouragement. Bill Gates will talk about what happens after OLE and NT -- it's called Cairo -- and why he hired Jim Allchin from Banyan and Paul Leach from Apollo/HP. They are working on Cairo, Microsoft's next-generation system, which will be fully distributed and secure, with its own object-oriented file system. This is the kind of robust underpinning that we'll need to realize all the object-oriented fantasies -- including information at your fingertips.

Sun's Bill Joy will discuss some of his work and ideas -- which may or may not appear as Sun products -- for a richer object-oriented environment for the future. However, he's concerned that vendors (Sun/HP included) focus too much on features and functions at the expense of elegance and simplicity. In short, you can't add elegance to existing systems; you have to start with it, since elegance is a property of an architecture as a whole.

Alliances and value

There are two kinds of alliances: Those focused on complementary offerings that fit together (like objects), and those where competing companies band together. (Guess which works better and lasts longer.) One has to do with open APIs that allow vendors' products to work together; the other with enforced APIs, usually so that the have-nots can compete with a single more successful vendor whose APIs needn't be enforced; they've already been selected by market forces. (Let the free market attract value-added instead of relying on alliances and contracts.) OSF was one such competing partners alliance; so is the Vendor-Independent Messaging interface steering group. Sometimes they survive; others, such as ACE, may founder. The factors involved vary; we will discuss them on Tuesday. How much can such alliances change history, and how much are they simply artifacts of market forces?

The softwareless software company...? Who will own the value in the future? Except for the OS vendors themselves, everyone would prefer to see the operating system become a commodity. And it will, starting on the client side first. The value will lie in the tools, class libraries and installable components -- including object-oriented databases that will take over the role of file systems and naming services. Most OS functions will be managed by modules that sit on top of a vanishingly small kernel.

Standards are just temporary rigidities in a continuously evolving marketplace. (See Release 1.0, 6-88, 11-89.) There's a short magic moment where one vendor "owns" the standard and no one else does, which is when people make their money. But eventually a standard either falls into disuse or is effectively cloned, depending on the owner's attitudes to intellectual property. (Ashton-Tate, for example, clung tightly to dBASE, while IBM gave the PC away.) Then the market moves on to another layer such as operating environments, or another platform such as pentops, and new players emerge. The new players of the future, we believe, will be those who control class libraries (not programming languages, communications protocols or architectures), network facilities and communication networks, and who can charge for services and transactions.

Object-oriented technology: Can we get there from here?

Reusing code is often listed as one of the benefits of object-oriented computing. However, object-orientation alone doesn't make code worth reusing. Like most magic, it works only if you follow some additional rules. The trick is to reuse the right modules, and to modify them appropriately. Rather than explore the wonderfulness of objects, accordingly, we'll discuss how to make the transition.

There are lots of ways to be object-oriented without writing in Smalltalk or C++ -- and lots of ways current products can move towards object-orientation. As limned in Dave Winer's evangelical script, all the vendors on the object-oriented technology panel need help from the application vendors, who must start making their apps more open, with clean interfaces, so that these tools and environments can exploit their capabilities. While these vendors can impart leverage to an object's functions, it's the application vendors who provide the actual functions to be leveraged.

For starters, an object-oriented database can hold all kinds of useful data -- what Borland calls "user-familiar objects" -- such as spreadsheets, diagrams, voice annotations and the related components of a compound document, along with routing rules, integrity constraints and other methods. What makes an object-oriented database such as Ontos different from a database that holds objects is the OODB's ability to manage the richness of objects itself, rather than merely to supply data to an application that supplies that richness at runtime. Thus an object-oriented database can manage objects according to their individual behavior and structure without the presence of any application at all. (Another way to state this is that at least part of the application is maintained with the data in the database, as methods.) What's the practical implication? In many cases, very little, but when you start dealing with complex objects and integrity requirements, an object-oriented database models the abstractions more closely, performs better, and is easier to work with. You don't have to model the constructs with relational joins and application code; you can simply put them with the data.

Ontos's Frank Ingari first saw the light at Lotus when he was managing hundreds of developers working on different versions of 1-2-3: "I realized that the burden of managing all the code components was bigger than the challenge of developing new functions. The core development team was small, about 15 people, the environmental [i.e. drivers and other utilities] team was about 20, and the QA and testing staffs were huge -- about 90. I started reading; there just wasn't a procedural architecture to handle this..."

A script for success

Another way to leverage existing applications and treat them as "objects" is to write scripts with them (regardless of how they're stored). Basically, scripting is a way of reusing application code, forming it into meta-applications that use and sequence discrete functions of the underlying applications. Thus the commands of the underlying applications become the user's programming language, manipulated in the syntax of the scripting tool. With familiar applications, even a fairly naive end-user can exercise a surprising amount of power. Alternatively, a scripter can create applications for other users. UserLand's Dave Winer, who developed the Frontier scripting tool (see Release 1.0, 5-91), will urge application vendors to make their applications

scriptable: "We already have applications out there designed to serve users' needs, but they need to be wired right [with open APIs or AppleEvents] so that they can be automated, customized, simplified and integrated."

Objects will also create a need for network operating systems that know how to find and handle objects, find their parents and methods, synchronize their activities and so forth. Darrell Miller of Novell is trying to assemble the requisite technology -- internally and from third parties -- to make that happen on top of NetWare. (Implementations of the OMG's Object Request Broker will also provide many such services but not the OS itself.)

TUESDAY LUNCH: ANATOMY OF PREDICTION

At lunch Doyme Farmer will talk about something completely different: how to apply rocket science to business problems. Farmer is perhaps best known for being kicked out of Las Vegas for figuring out how to beat roulette wheels as described in Thomas Bass's book *The Eudaemonic Pie*; his more serious work was described in James Gleick's book *Chaos*. More recently, he was featured in The New York Times (page 1, no less) as part of the vanguard of military workers leaving that world for commercial endeavors. His guiding interest is the mathematics of self-organizing systems, everything from evolution and cell development to the origin of life and machine learning -- and, as it happens, patterns in the financial markets. Among other things, a visit by Dow Jones' Bill Dunn some years ago got him into exploring the predictive value of non-linear dynamics in stocks and currency trading -- and now he's left Los Alamos Labs to start Prediction Company to do just that. The firm is for-profit, but Farmer plans to plough his share of the profits back into theoretical research. He also still spends time at the Santa Fe Institute working on chaos theory as applied to the nervous system.

WEDNESDAY: PENS AND GROUPWARE

After two days of platforms and strategy, it's time to discuss some tangible products...

Over the last year, skepticism about pen computing turned to enthusiasm. Now, it's meeting with impatience: Where are the machines? Although there are pen machines out there -- most notably products from long-time supplier GRiD and from newcomer Momenta -- the flow of pen-centric machines predicted last year hasn't yet materialized. This may be a good thing, since the operating systems are late too. Application vendors such as Slate are champing at the bit, waiting for the machines and OSes to start shipping this spring. It took more than 20 months to ship Excel after the Mac came out, 16 months after the PC for 1-2-3, says veteran Vern Raburn, now chairman of Slate. He confidently predicts 12 vendors shipping pen computers by year-end, supporting at least 50 applications. Call it PENT-up supply.

Are pen machines worth waiting for? Is there a difference between, say, the GRiDPAD with PenRight! and generic hardware with the PenPoint system (both of which were being used, with software from Pen Pal Associates and Slate respectively, to take the e-mail survey)? For all that GO stresses PenPoint's scalability, it now requires a high-end, 386-based computer to run

acceptably, as does Microsoft's Windows for Pen Computing (known to friends as PenWindows). Of course, by the time the installed base amounts to much, more powerful hardware will abound, and 2-pound 486-based pen computers will probably sell for about \$2000.

Jerry Kaplan of GO and Kamran Elahian of Momena will both give illustrated comments. Kaplan wants to illustrate the power of the pen for high-value, horizontal applications, while Elahian's main message is the benefit of tight integration of hardware software and support from a single vendor. The company has already shipped more than 400 systems to end-users.

Meanwhile, GeoWorks has announced Pen/GEOS (for Graphical Environment Operating System), targeted at even smaller machines for under \$500. Brian Dougherty of GeoWorks and Jeff Hawkins of Palm Computing are working together, along with hardware vendors such as GRiD and Poqet, and components suppliers such as Chips & Technologies. Hawkins is enthusiastic about GeoWorks, but he's also enthusiastic about \$400 palm computers in general: "If Apple has one," he says, "we'll support it too. We want to be the Slate of mass-market palmtops." (How quickly role models are risen!) Palm Computing shares ownership of a low-resource handwriting technology with GRiD, which Hawkins started developing during a two-year leave from GRiD when he was working on neurobiology at Berkeley. (Yes, the two technologies are related.) Dougherty, meanwhile, should find the pen computing market refreshingly open after selling a respectable 400,000 copies of the PC/GEOS desktop operating system. That will look like peanuts if this consumer market takes off.

The bandwidth between the user and the machine and between the machine and the rest of the world should be minimal, while the ability to interpret information at either end should be maximized. Pen gestures are just one way -- but an important way -- of low-bandwidth, high-content communication between person and machine. Does this mean a whole new operating system? We believe it does, but there will be a lot of trial and error before the ultimate system is achieved.

One year after last year's excitement at the Forum, we're still fervent believers in pen computing. But we place more emphasis on the physical form factor -- having carried a few of them around. Only when the physical machine passes muster can the software play its role: supporting developers, enabling the system to hold a lot of data compactly (as objects), managing intermittent communications smoothly, and understanding the user's intentions with a minimum of effort by the user.

Groupware: Three visions

Aside from Notes, NCR's Cooperation is one of the few large-scale groupware tools/environments out in the market, with customers such as Hartford Insurance & Citibank (see Release 1.0, 3-91). It's a potentially significant means of differentiating NCR now that the company is vigorously promoting open systems. Already, says NCR's Gil Williamson, customers have benefited not just from the software itself, but from the process they go through as they install it. Frequently, they end up redesigning their processes, gaining efficiency not just from automation but from better business design.

While NCR works from a platform, supporting third-party applications with its integrating environment, Borland and Lotus both work from their own application suites out. They have overall similar views of the future capabilities of software/groupware, but the implementation details affect the flavor of their systems. Both companies agree that most business processes are concerned not just with data sharing, but with stating, negotiating and fulfilling commitments. Without perhaps using such language, both companies will give users the tools to set up and monitor the completion of tasks. For example, setting up a meeting isn't simply a matter of sharing data. It requires a proposal and a confirmation -- or agreement on a new date.

Notes: Adding sending to sharing

Lotus Notes is built around a logically central database, even though it's physically replicated and distributed. The system offers a shared repository of knowledge that's available in different formats and subsets to all its users (subject to security authorizations).

Notes was developed independently of Lotus and indeed wasn't really understood by the company until recently. (Now that John Landry has arrived, the company is undergoing a dramatic shift in its orientation -- and its visible self-esteem.) Now, Notes is being extended and redefined, to be more open to other environments (partly through the DDE and OLE facilities of Windows) and to integrate with e-mail, especially Lotus's own cc:Mail, although the company was also the catalyst behind the VIM interface, over which it has sensibly ceded control to a steering group. Lotus is also incorporating some workflow capabilities into Notes, using technology from Action Technologies. (A small piece of this will be demoed at the Forum: The system will notify users via SkyTel message receivers when they have mail, and will monitor whether messages are answered.) Says Lotus's Terry Rogers: "We've been sharing; now we have to start sending as well."

Both companies -- in cooperation with Novell and Apple, with support from IBM -- have agreed on the Vendor-Independent Messaging interface, a standard developed in response to Lotus's OMI proposal (see Release 1.0, 2-91). That means any firm's applications should be able to use the services of any other's transports for a small set of defined functions such as send, receive and address-resolution for that clients on that transport. It's narrow -- but believable for that very reason.

Borland: Starting with the familiar

By contrast, Borland starts from its own desktop applications out -- what it calls "User-Familiar Objects." Basically, it is extending its Borland Object Component Architecture (BOCA), moving beyond data-sharing and user-object sharing (forms, reports and queries) through a database to workgroup support through messaging over transports such as those supporting VIM. A traditional database approach lets users share subsets of data, with the database jealously maintaining the integrity of the data.

Workgroup computing however, includes some abstraction of the users as well; they don't just share data, but work with discrete objects that may cross

application and database boundaries. Users deal with *each other*, not just with the database. The individuals can exchange messages and commitments. The database moves from being a central manager of the data to being a repository for data managed by the individual UFOs and individual users (even though underneath it all, Interbase maintains data integrity, versions and other database niceties). Interbase is a relational database with the ability to handle BLOBs (or basic large objects), described in Release 1.0, 12-88; Borland got it along with dBASE in the Ashton-Tate acquisition.

All this extends an approach first visible in SideKick 2 (see Release 1.0, 11-90), where individual users manage their own data, but it is mingled and reconciled (carefully) with others' calendars and contact lists. SideKick 2 includes facilities for reconciling a personal contact list with the corporate list, or the calendar a user keeps on a laptop with the one he keeps at work. Such reconciliation isn't traditional database management, but requires application-specific techniques or transactions that reflect the particular content and functions relevant to the data of a particular application (call them the UFO's methods). In the future, this approach will encompass the entire Borland application suite, and complying applications from other vendors as well. Data will be able to be shared and reconciled across applications such as spreadsheets (cf. Lotus's Chronicle), databases and appointments books, documents, etc.

The InterBase foundation will also manage workflow transactions (although they won't look like database transactions, but rather like messages that are simply recorded by the database). While Lotus wants a single logical database, Borland is more comfortable with the notion of multiple different sites, with data only partially shared as necessary. "The world isn't always completely in synch, and people share point-to-point, not just through a database," says Borland's Richard Schwartz. "So why not reflect this in your software?"

COMPANY PRESENTATIONS/PROFILES

While there's a healthy diversity among the companies and products featured in the company presentations, there seems to be more of a theme than usual this year (or did we just pick more carefully?). While attention is focused on user interfaces, personal productivity and cute client applications, the most exciting activity seems to be going on at the server side, loosely defined: AMIX, Channel, Client Server Technologies, Edify, HyperDesk, Ontos, Transarc, Trilogy and XcelleNet. Da Vinci and Reach are both moving e-mail from a tool for personal communication to more of a server-managed group tool, while Edify's agents work for the enterprise (or for customers) rather than for individuals.

It's not that personal productivity doesn't matter anymore, but that developers and perhaps even customers are now worrying about how to make people productive in a broader context. These software tools, rather than cheap hardware, will foster the transition to downsizing.

Surprisingly, the only UNIX products are systems and utilities; the UNIX community still seems to be selling more to itself than to end-users. Other interesting areas include object-oriented tools -- HyperDesk, IntelliCorp, Ontos, Serius and Servio -- and information services -- America Online and AMIX. Then there's the sleeper of them all, Maxis, with a new (or very old) approach to programming -- biology. On the pen end of things, this year they're personal tools (although Pen Pal is targeted at vertical applications). But next year will see a wide range of communications devices and services, many of them wireless, aimed at bringing mobile computing into the connected infrastructure. We're waiting!

America Online: a civilized frontier

America Online is the only independent major online information service, with about 155,000 subscribers in the US and Canada. Founded by its current management in 1985 for Commodore 64 and Apple II computers, it filed to go public just this month, planning to raise \$20 million. It had revenues of about \$20 million last year; average monthly revenues are now \$14 per customer. The company began as a sort of private-label provider, setting up and running communications networks in partnership with IBM, Tandy and Commodore, which were sold through coupons packaged in the vendors' boxes. Now the company is getting more aggressive in marketing and establishing its own independent identity. Its most interesting current project is a venture with the Chicago Tribune scheduled to roll out this spring: The Tribune and local schools and advertisers are providing editorial material, subscriber lists and marketing, and America Online is offering a local online service, targeted to the local community. America Online will pay the Tribune royalties based on subscriber usage. This arrangement leverages the strengths of both parties, and shows newspapers a way to enter rather than resist the electronic frontier. Next fall, America Online plans to launch a similar service in Orlando and Fort Lauderdale with two more Tribune-owned papers.

American Information Exchange: information market

American Information Exchange is the first online service that treats information not just as a commodity to be sold for a fixed price per byte or log-on time, but as discrete products that can be priced individually. Moreover, the system even allows individuals to negotiate prices and content for information to be created on request. Thus, like the best markets, it implements a powerful feedback loop that should result in the creation of more of the most valuable information, as determined by the buyers. (See Release 1.0, 7-89, 12-91.) The service has collected about 400 accounts since it opened for business in January. More importantly, with the return of John Walker to active involvement at Autodesk, AMIX's parent, the service is no longer being kicked off the loading dock (in traditional Autodesk style) and is likely to get the corporate funding and enthusiastic support it deserves.

Channel Computing: a data pump for the firehose

Channel Computing first publicly showed its first product, Forest and Trees, at PC Forum in 1989. That product, one of the first client/server client applications and now successful with 3100 company customers, is a sort of data consolidator/alarm system that allows users to monitor data and ratios among data from a variety of sources. You could say that it allows you to tap the proverbial firehose.

Channel's new product, code-named Lookout, is a client/server server application that allows you to hook up the firehoses to each other. Lookout is a database administrator's tool that allows the user to organize and schedule regular transfers of data from one server to another. That is, you may want to consolidate certain figures from a DB2 database every week into a database designed for regular tapping by tools such as Forest & Trees, spreadsheets with data-query back-ends or other end-user tools. Lookout assembles the data for them, according to scripts which transfer the data on schedule or in response to triggers or requests, managing security and keeping queries from tying up production databases. The regular pumping of data enables resource-intensive queries to be scheduled in off-hours, and to make sure data is appropriately updated. Lookout saves labor, but more importantly, it is more reliable than human labor. Client programs can execute against subsets maintained by Lookout, or against existing databases updated by Lookout. Lookout runs on OS/2, and stores queries and scripts in its own SQL Server database. It works with the usual SQL databases, IMS and IDMS, Tandem, Teradata and Lotus Notes, among other. Implicitly, Lookout acknowledges that the world is never truly synchronized and that it's not worth keeping the whole world up to date all the time.

Client Server Technologies: LANlord manages LANs

Client Server Technologies' LANlord is also an administrator's tool -- this one for LAN administrators. Started with funding from Microcom in 1990, it was in the process of being acquired by Microcom this month for an undisclosed amount. Cleverly named, the product helps a network administrator find, define and manage the resources on a NetWare network of DOS and Windows clients. Future versions will also work on LAN Manager and Vines networks. The manager portion system itself runs on a dedicated OS/2 server with a Windows client (not dedicated) for the human LAN manager, and then there are agents that run on the individual workstations and report to the server. Like the Mac systems described in our August issue, LANlord's agents traverse the network and automatically builds a Btrieve database of network resources, including machines, system software, applications and peripherals. Founder Emerick Woods' long-term goal is to provide a platform for a variety of system management applications; current offerings from Client Server itself include workstation event and network monitoring, metering of software usage, security, asset management and various kinds of reporting. It's extremely extensible -- one of the reasons behind the acquisition by Microcom, which plans to invest significant sums in expanding this business to complement its own communications businesses.

Da Vinci Systems: e-mail in enhanced form

Da Vinci Systems is a hot item right now -- the largest significant independent e-mail company with about 1 million users, although Novell holds a significant minority stake. (Reach Software and Beyond Incorporated, which made its debut at last year's PC Forum, are visible but still small in numbers.) Da Vinci shipped a new, DOS-based version 2.0 of its eMAIL package last fall, almost a year later than planned. The product was fully rewritten to make it more modular and extensible. The benefits of that should soon be apparent, since Da Vinci should find it relatively easy to make the next step, which it will outline at the Forum: adding forms and routing capabilities to its product, entering the same market as Reach Software. The new forms-enhanced version 2.1 and a companion product, FormServer, which

will manage and route the forms, will be using workflow technology licensed from Action Technologies.

Delta Logic: reverse-engineered text queries

Delta Logic, a six-person consulting company, was founded six years ago by John Hiles, one of many refugees from Digital Research after its early heyday and before its current revival. Delta Logic's ReCap is more a technology than a product -- a tool for categorizing text that could be incorporated nicely into a variety of e-mail or other text information management tools. Basically, ReCap performs statistical analyses on texts to determine what distinguishing words they contain, and then presents them to a user or potentially to another application. The algorithms consider not only the words in each individual article, but their frequency relative to their frequency in the surrounding text base. The set of words generated is not a formal categorization but is usually enough to enable a user to determine whether the text chunk is what he is looking for -- or whether it would interest him, if he is just browsing. Consider it a sort of topic-list- or reverse-query-generator: It tells you what set of words would describe this article in particular, as distinct from than any other in the text base it belongs to. The system can also use the algorithm as a query to select the few most "topical" sentences in the article to produce a summary -- a few sentences that capture at least some of the key ideas; this rule-of-thumb technique works surprisingly well.

Edify: agent server

Edify was founded in 1990 by a collection of industry veterans from IBM, ROLM, Metaphor, Sybase and other auspicious places, with funding from Sutter Hill, Technology Venture Partners, Greylock and others. Its \$60,000-up, 486-based Information Agent lets end-users automate simple tasks by creating agents to automate routine functions such as collecting data and document images and editing and delivering them over a variety of media. Unlike most "agent" tools, its focus is "enterprise" agents rather than personal productivity; it automates corporate processes rather than individuals' tasks. Its other distinction is its ability to use a variety of media, superseding special-purpose fax tools, e-mail scripts, voice mail and other one-off tools with a more flexible system that can handle everything. Moreover, it lets end-users take advantage of these capabilities. Its Agent Maker module works in a program-by-the-icons fashion, encouraging users to think out their tasks in broad outline and then program each step by example. Technically astute reviewers may find the tool simple-minded (and probably won't like its default bubble-gum pink and purple color scheme either). But Agent Maker has about the highest power-to-scariness factor of any end-user tool we've seen. It's valuable both as a thinking tool -- for visualizing and validating processes -- and as an automation tool.

GeoWorks: OS on a stick

GeoWorks initially positioned itself as the company taking on Microsoft with an alternative to Windows. Although it has sold an amazingly fast 400,000 copies of the low-resource PC/GEOS environment over the 13 months since introduction, that's still hardly 13 dots to Microsoft's inch on Microsoft's 300 dpi screen. (One dot = 30,000, one inch = 9 million.) Now the company is embarking on the next phase of its business plan, entering the mass mar-

ket. The first product is a ROM version of GEOS for tiny, sub-\$500 palmtop computers, such as the PoqetPad and GRiDPad. It can be keyboard- or pen-based, depending on the UI. The computers aren't quite at \$500 yet, but never mind. They will be soon, because they use increasingly cheap single-chip 8086 pcs, such as Chips & Technologies forthcoming 14-MHz model. Founder Brian Dougherty's vision is that these machines, like pentop computers, don't need DOS but something more tailored to their own environment and less power-hungry. With a good mail/fax package and a wireless modem, GeoWorks could create -- and own -- a new category: e-mail on a stick.

HyperDesk: object-oriented platform

HyperDesk was the only non-establishment company and the only software house to play a big role in the Object Management Group's recent Object Request Broker standard (see Release 1.0, 3-90). The company's original motivation was to have a standard platform/ protocol around which to build a suite of object-oriented office automation tools. Two years later, that has finally happened, and HyperDesk is probably the first company to have production software based on the ORB. (Its implementation of the ORB spec was merged with work from DEC, and that joint effort was then merged with proposals from Sun, H-P, and NCR.) HyperDesk was spun off from Data General, where the principals were working on a project that became HyperDesk, and is funded primarily by ASCII Corp. of Japan. Just like UserLand's Frontier, HP's NewWave and other object-oriented environments and tools, HyperDesk now needs a large base of applications with clearly exposed interfaces to provide objects for its system. It runs on UNIX servers, with either UNIX or Windows clients. HyperDesk's chief architect Bill Andreas and Joe Forgione will talk about the product, and also place it in the context of the Object Management Group's Object Request Broker standard.

IntelliCorp: oldest living objects

IntelliCorp was almost acquired by KnowledgeWare last summer, but the deal fell apart when KnowledgeWare itself fell apart. IntelliCorp, which began life as a biotech play (IntelliGenetics), became an AI company and is now an object-oriented pc tool company. Over the course of ten years, it has sold \$150 million worth of object-oriented tools over the years to commercial users. Its object-oriented development tools, Kappa-PC and ProKappa, are distinguished by their integration of design and construction -- i.e., executability of high-level designs. Taking CASE designs to implementation on PCs and UNIX. IntelliCorp's primary customer base is large corporate customers such as General Motors, IBM and AmeriTech. ProKappa is probably the closest thing to NextStep for generic UNIX right now, while Kappa-PC is a Windows-based client tool with a compatible object model.

Maxis: artificial life as a programming paradigm

We first noticed Maxis when it came out with SimCity (see Release 1.0, 6-89). It has since produced SimEarth and SimAnt and bought ElFish, first demoed at last year's PC Forum. The idea behind all of these smacks of evolution, self-organizing systems and simulation with active objects (where the objects interact with each other rather than with a programmer's script). Started more or less as a games company, Maxis is now becoming semi-serious -- without losing its sense of humor, we hope. The company is working on its next product, SimLife, which it will demo along with ElFish,

now in final development. SimLife is an evolution simulation, in which you develop an ecosystem and watch the coevolution of a vary of species and the feedback loop between them and the environment. (For example, you could put a human-like animal in there and watch it screw things up.) ElFish lets you "breed" electronic fish with a rich gene pool. Jeff Braun will do a show-and-tell, but he'll also discuss the potential application of artificial-life approaches to productivity tools, and how they could help software adapt to its users.

Ontos: object-oriented database

Ontos is one of the five horsemen of the object-oriented database business: Ontos, Object Design, Objectivity, Servio and Versant. It is here for itself but also as a proxy for all the others (including smaller companies as well). At this point, while the five are vying vigorously for a small market, the biggest problem they really face is persuading most people that the market exists at all. (Just wait for Oracle to enter it, and then people will believe!) Ontos, which is extremely focused on commercial applications, has been through as many incarnations as IntelliCorp. The company is now headed by Frank Ingari, best-known as vp and general manager of Lotus's spreadsheet division from 1988 to 1990. Before that Ingari ran marketing at Atex, and is especially interested in the use of OODBs to support office automation and publishing systems, managing compound documents and other common office objects. For now, Ontos's strongest markets are network management and data integration (presenting multiple data sources as one to a user). The deal everyone is waiting for, Ontos under Notes, may not happen given that it has not happened already, but Ontos would be a fine foundation for someone attempting to build a competitor to Notes.

Pen Pal: practical pens

Pen Pal's Pen Pal is a simple, sensible toolkit for developing pencentric vertical applications, using the GRiD PenRight! runtime engine. You can get a chance to use a quick application built with Pen Pal (or Slate's PenApps) if you fill in the e-mail questionnaire offered at registration. Pen Pal lets users create complete database applications, with forms, conditional logic, communications and printing -- all without C or API calls. It works through menus, and lets users design their forms on the screen. The company was formed in 1990 by Sam Wiegand, president of GRiD from 1984 to 1990, and Mike Green, a founder and former vp software at Tandem. It currently has eight employees, and has received funding from the founders and Institutional Venture Partners.

Reach Software: workflow with objects

Anand Jagannathan founded Banyan in 1983, and Reach Software in 1988. Reach showed its first product, MailMAN, at PC Forum last year. This year it has just shipped WorkMAN, a far more interesting product that lets users build and execute workflows. In our formulation, WorkMAN is work-oriented workflow -- as opposed to the two other kinds, user-centered (such as Beyond-Mail, where the user is the focus of control, and group-centered, where control is centralized. In WorkMAN, the control is embedded in the work object, usually a document or some other object that travels through the system to complete a task, following rules embedded in it with the WorkMAN development tool. The rules can control its routing and the information it

presents to and collects from each user or application on its appointed rounds. Of course, there are conditional routings depending on data values or other criteria, alarms if a task is delayed, and other options. The system works with NetWare and Banyan's Vines (of course), and will support VIM. Its internal database is Btrieve, but it will add generic SQL support.

Serius: class libraries for the rest of us

We wrote about Serius at length in December, just before it showed release 3.0 of its development system and component libraries at MacWorld. The system illustrates clearly many of the concepts of component software: It's a set of modifiable, extendible application components built to work together, and capable of being assembled into new applications by capable users. For now, the company has finessed the issues of how to charge for its components as they are reused, figuring it's best to get established first, and then to worry about getting paid.

Servio: code-free GUIs

Servio is the oldest of the object-oriented database companies, and the one with the most developed suite of front-end development tools. Its GeODE (for GemStone Object Development Environment) is a "code-free" GUI development tool, designed for building graphical applications without writing code. Assuming that the appropriate objects already exist, GeODE lets you visually design both the flow and the look-and-feel of an application. Underneath, it has a rich development environment based on Servio's GemStone object-oriented database. GeODE runs on SPARC machines now, with Mac, OS/2 and Windows versions promised.

Slate: PenEverything

Slate wants to be the Microsoft of pen computing, down to its interest in providing such basic system components as its recently announced LapLink Pro for PenPoint, a product developed in cooperation with Traveling Software (see Release 1.0, 1-92). Slate's mission is pen computing rather than any particular pen platform, and Slate chairman Vern Raburn can list balancing good and bad aspects of PenPoint and PenWindows. Slate's line-up now includes PenApps (which was used to create one version of the e-mail questionnaire at registration); At-Hand, a spreadsheet; PenBook, for publishing documents and documentation; and Day-Timer Pen Scheduler under license from Day-Timers, Inc. Most of the products are available for both PenPoint and Microsoft Windows for Pen Computing; Slate is now waiting eagerly for a hardware base to sell into.

Slate will show the recently announced Day-Timer Pen Scheduler at the Forum. It's not the all-singing, all-dancing, database-based personal information manager you might expect, but a cleverly crafted scheduler designed to maximize its utility to the user (rather than feed a corporate database). "We call it 'computer-assisted,' not 'computerized'," says Day-Timers president and ceo Steve Rowley.

Thus Pen Scheduler doesn't recognize each user-entered item as text and index it by strings or value (see "Ink over characters," Release 1.0, 8-91). Instead, it stores most appointments and notes as ink, indexing them as the user does -- by date, time, user-defined categories and even appearance --

through a "gallery" feature that lets you see a (scrolling) set of miniaturized pages for any particular day, to-do item or appointment. Like other data, ink items can be copied, assigned to every third Thursday, or printed out, but they don't need to be interpreted by the computer as long as the user understands them. (The name & address book, however, is text, although you can store ink there for recognition or translation later.)

Although the underlying technology, especially the inkwork, was developed by Dan Bricklin (of At-Hand fame), the product also owes a lot to the relationship with Day-Timers (a subsidiary of American Brands, by the way). The goal is to leverage Day-Timers' success -- and a system/interface that many users now consider "intuitive."

As a technology nut, we're disappointed that Pen Scheduler doesn't use the full power of the computer. But as a practical user, we see it as a product we might actually use -- all the time telling ourself that we'll take all the information and put it in a real database someday soon. (Right now we keep our schedule and a phone list in two wp files; we're planning to load those into a real database someday soon too.)

Transarc: standard plumbing

Transarc was founded in 1989, with partial funding from IBM and a variety of project revenues, to commercialize technology from two projects in advanced computing at Carnegie-Mellon: Camelot, a DARPA-funded project in reliable distributed computing, and Andrew, an IBM-funded campus-wide network with leading-edge data-sharing functions. They have been reborn respectively as Encina, a transaction-processing toolkit for the OSF Distributed Computing Environment (DCE), and AFS, both a current Transarc product and the basis of the data-sharing facility of OSF's DCE. Transarc Chairman Al Spector, who spearheaded the work at Carnegie Mellon, will focus on DCE, Encina and the role of distributed transaction processing in object-oriented environments. Transactions are a guarantor of integrity: Just as objects are encapsulated data, transactions are encapsulated activity.

Trilogy Development: configuring a new industry

We wrote about Trilogy last October. Its business right now is configuration management: It sells an object-oriented tool for modeling a product line and how its components fit together, for use by manufacturers to configure semi-custom systems for customers. Long run, we envision it as the foundation of a service that could run over the global network, configuring products with components from *different* vendors. Just as Compaq has started a multi-vendor support effort, so could Compaq (or someone else) start a multi-vendor configuration service. But if Trilogy is smart it will try to keep that business for itself. Like Serius, Trilogy ties in nicely with the component model of software and systems.

UNIX System Labs: UNIX has it now

Why wait for NT? New USL president Roel Pieper will talk about the newest version of UNIX (Lite) and, more importantly, explain his strategy for getting it onto more desktops. He sees UNIX (from either USL or OSF) as a platform for open component computing, hospitable to third-party components such as Transarc's Encina or Tivoli's WizDOM -- to say nothing of applica-

tions. He will show simultaneous demos on a "cheapo pc" and a SPARC notebook. How come none of the exciting apps at the Forum are UNIX-based? we asked. The point isn't just the applications themselves, Pieper responds, but how effectively UNIX can group-enable the apps, supporting connectivity, modularization and all the things the Forum is addressing. All UNIX needs is modular applications -- and the distribution channel and pricing that Univel, the Novell/USL joint venture, will provide starting this year.

XcelleNet: wide-area groupware

Before we really have the global network, XcelleNet has already been profitably helping large corporate customers to construct their own subsets. With about \$5 million in funding from private investors, Sutter Hill, Greylock and Motorola, XcelleNet sells a tool for "wide-area applications with remote systems management support." A typical installation (software only) costs \$50,000 to \$100,000 to start. The basic idea is to make it easy to build transaction-oriented "client-server-server" applications to support large numbers of remote pcs or LANs, or even nomad machines (pentops and laptops). These clients communicate with an XcelleNet server, either locally or at a central site. The XcelleNet, "middle" server turn is a client to a main server -- typically a corporate mainframe or LAN. The middle server mediates communications and data management between the clients and the main server, preparing and uploading the right subset of data to the host, while maintaining more detailed records locally. Typically, XcelleNet is used by a large corporation to develop applications (electronic forms, queries, mail, etc.) that are rolled out to a large number of branch offices, outlets or other semi-autonomous units which are best served (or so MIS thinks!) by centralized configuration and control. Incorporated in 1986, the company has 170 customers in 14 industries, including Burger King, American Express, and Mailboxes Etc.

Special session: Central Europe and the Soviet units

This special session will provide a chance for those who are interested to meet the attendees from Central Europe and the Soviet units. The computer community in this part of the world reminds us of Silicon Valley 20 years ago -- people with enormous intelligence but generally little business experience building a new industry from scratch. To hear what conditions are really like and perhaps to find potential new products or potential resellers of your products, come meet:

- Roustem Akhilarov, head of R&D at Steepler, a major distributor of Microsoft, Hewlett-Packard and other pc products in Russia. Akhilarov runs a 25-programmer team focused on networking and e-mail.
- Anatoly Karachinsky, technical director of InterMicro, Moscow. InterMicro distributes both Sun and Apple (although the exact territory covered is undefined right now). InterMicro has a flourishing desktop publishing business, and also installed the first ATM system in the Soviet units that delivers cash in rubles. It had about \$10 million in revenues last year.
- Eduard Mika, executive vice president and co-founder of APP Systems, Prague. APP is the only distributor of Oracle in Czecho-Slovakia, and focuses on large systems integration projects, especially for banks,

machinery, PTT and government. The company was founded in July 1990 (shortly after the Velvet Revolution in November 1989) and has already grown to 187 people.

- **Stepan Pachikov**, founder and president of ParaGraph, Moscow. ParaGraph is best known for its cursive handwriting recognition technology, licensed to Apple among other companies. (See Release 1.0, 10-91.) It also produces and sells word-processors, utilities and other software, and is a reseller of Microsoft products. This commercial success funds one of the most productive R&D software efforts in the country.
- **Bogdan Wisniewski**, president of Karen International, Warsaw. Karen distributes Sun computers and Borland software, among other things, in Poland. It also does system integration projects using Progress Software and installed an inventory management system for Poland's largest retailer, Pewex.
- **Andrei Zotov**, president of the Borland User Group Association, Moscow, is also an employee of Borland distributor Interquadro. Borland has several hundred thousand users and a constantly growing paid-up installed base of more than 13,000 packages in the Soviet units. Much of the growth is due to Zotov's efforts.

Special session: Meet the dealers and distributors

This special session on Tuesday is being organized by Bobby Orbach. In short, it takes one to know one. Formerly the most visible person at 47th Street Photo (although no one ever knew his title, which was "vp business development,") Orbach now runs Orbach Inc., which gives advice to deserving companies on how to build strategic alliances and make the bigtime. Now that he's no longer their competitor, other retailers and distributors like Bobby even more than they used to. Those participating will include Kathy Kolder of Fry's Electronics, Bruce Frederickson of Amaze Inc!, and Pat Gallup and John Eroszonak of PC Connection. The session will discuss the current state of distribution, and give vendors a chance to ask the channel what it's looking for in the way of new products and merchandising ideas.

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SPEAKERS & COMPANY PRESENTERS

Allan Weis, **Advanced Network and Services**, (914) 789-5302; fax, (914) 789-5310

Steve Case, **America Online**, (703) 448-8700; fax, (703) 883-1509

Chris Peterson, Gayle Pergamit, **American Information Exchange**, (415) 856-1234; fax, (415) 856-4123

Richard Schwartz, **Borland**, 33 (1) 4629-3640/3641; fax, 33 (1) 4629-3650

Mark Klein, **Channel Computing**, (603) 659-2832; fax, (603) 659-7590

Emerick Woods, **Client Server Technologies**, (914) 633-4100; fax, (914) 633-4129

Barry Berkov, **CompuServe**, (614) 457-8600; fax, (614) 457-0504

Bill Nussey, **Da Vinci Systems**, (919) 881-4320; fax, (919) 787-3550

Michael Dell, **Dell Computer**, (512) 338-8455; fax, (512) 338-8366

John Hiles, **Delta Logic**, (408) 373-8688; fax, (408) 373-7020

Jeffrey Crowe, Charles Jolissaint, **Edify**, (408) 982-2000; fax, (408) 982-0777

Mitch Kapor, **Electronic Frontier Foundation**, (617) 876-0900; fax, (617) 876-

Brian Dougherty, **GeoWorks**, (510) 644-0883; fax, (510) 644-0928

Jerry Kaplan, **GO Corporation**, (415) 345-7400; fax, (415) 345-9833

Herb Osher, **HyperDesk**, (508) 366-5050; fax, (508) 898-3841

KC Branscomb, **IntelliCorp**, (415) 965-5758; fax, (415) 328-9595

David Liddle, **IBM**, (415) 961-3600; fax, (415) 966-1637

Kathy Vieth, **IBM**, (407) 443-1087 or (415) 545-4616; fax, (407) 443-4117

Jim Cannavino, **IBM**, (914) 766-3220; fax, (914) 766-3818

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